



# SCIENCE

FOR FAMILIES

**YOU ARE** your child's first teacher. Learn how to support the goals of Oklahoma's academic standards and why they are important for your child. Please be in regular communication with your child's teachers and ask how you can support science learning at home. When schools and families work together as partners, it helps your child achieve academic excellence!

## PRE-KINDERGARTEN

### What to expect:

Science learning is particularly important in Pre-K because at this age, children have a natural curiosity about the world around them and a willingness to learn and be taught.

Children in Pre-K should be encouraged to make observations and describe how they are interacting with their surroundings. Provide positive responses when they say things like "A plastic spoon feels different than a metal spoon," "I am warmer when I put on a coat" and "A puddle splashes when I jump in it."

This information is a snapshot of learning in Pre-K science. For a complete set of science academic standards, click [here](https://sde.ok.gov/oklahoma-academic-standards) or visit [sde.ok.gov/oklahoma-academic-standards](https://sde.ok.gov/oklahoma-academic-standards).

### By the end of the school year, your child will:

- Express curiosity about the natural environment through observation and active play.
- Begin to participate in simple investigations like predicting what might happen next and testing observations.
- Start putting items that are important in a child's world (toys, pets and foods, for example) into categories based on observable features.
- Talk about major features of the earth's surface (streams, hills, etc.) found in your daily natural environment.

### What to do at home:

- Ask questions about the things your child is interested in and what he or she observes about the world.
- Describe where to find familiar plants and animals in your neighborhood or area.
- Talk about things your child observes about the different seasons.
- Encourage questions and make time for problem-solving to help your child find answers to questions.



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## Fostering Curiosity

Children are naturally curious and motivated to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Play is a wonderful way to nurture curiosity in young children, so be sure to allow plenty of playtime. Encourage your child to ask questions, discover answers and explore the world.

Cultivate your child's curiosity with guiding questions like these:

- When you look around, do you see things that are alike or different?
- What do you see when you look outside?
- What do you like to do?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Increase vocabulary, thinking skills and curiosity by using new words and having conversations that include questions that make your child think. Communicating with others gives children a chance to see and understand that there can be more than one idea on a given subject. Accepting these different ideas helps children learn how to get along with others. This acceptance fosters positive relationships with peers and strong self-image.

Cultivate your child's communication skills with questions like these:

- What fruit would you like to eat for lunch?
- Do you think you will need a jacket today?
- What was your favorite part of the day and why?
- How did you help someone today?

## Fostering Comprehension

It is important to give young children the opportunity to explore books. As you sit down to read together, encourage your child to flip through the pages and discuss what he or she sees. Use the following questions as a guide as you talk about the books you are reading together.

### BEFORE READING

- What do you see on the cover?
- What do you think the book will be about?

### DURING READING

- Who is in the book?
- What has happened so far?

### AFTER READING

- Did you like reading this book? Why or why not?
- What was your favorite part of the book?

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## KINDERGARTEN

### What to expect:

Kindergarten is when children begin to grow academically, socially and emotionally in a structured learning environment. Families play an important role in that growth as they model positive learning behaviors and become involved in school activities.

Science can encourage and expand this natural curiosity. Ask your kindergartner questions like "What happens if you push or pull an object harder?", "Where do animals live, and why do they live there?" and "What is the weather like today, and how is it different than yesterday?"

This information is a snapshot of learning in kindergarten science. For a complete set of science academic standards, click [here](#) or visit [sde.ok.gov/oklahoma-academic-standards](http://sde.ok.gov/oklahoma-academic-standards).

### By the end of the school year, your child will:

- Develop an understanding of patterns and changes in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather.
- Understand how different strengths or directions of pushes and pulls change the motion of an object.
- Develop an understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live.

### What to do at home:

- Work with your child to draw what the weather looks and feels like several days in a row.
- Kick a soccer ball and talk about how a harder kick makes the ball go farther.
- Walk around your neighborhood or a local park and name the animals and plants you see, then talk about why the neighborhood or park is a good place for them to live.



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Cultivate your child's curiosity with guiding questions like these:

- What do you wonder about?
- What patterns do you see when you look outside?
- What book do you want to read today?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Increase vocabulary, thinking skills and curiosity by using new words and having conversations that include questions that make your child think. Communicating with others gives children a chance to see and understand that there can be more than one idea on a given subject. Accepting these different ideas helps children learn how to get along with others. This acceptance fosters positive relationships with peers and strong self-image.

Cultivate your child's communication skills with questions like these:

- What is your favorite food and why?
- What rule have you followed today?
- How did you help someone today?

## Fostering Comprehension

Kindergartners are developing beginning reading skills and an enjoyment of reading. Make time to explore books, magazines and other types of print with them and encourage conversations as you read together. Use the following questions to help your child better understand what he or she is reading.

### BEFORE READING

- What do you think this book is about?
- What does this book remind you of?

### DURING READING

- What do you think will happen next?
- Where and when does the story take place?

### AFTER READING

- What happened in the beginning, middle and end?
- What was your favorite part of the book and why?

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## FIRST GRADE

### What to expect:

In first grade, children become more independent as their reading skills improve and they are able to focus for longer periods of time. Building upon science skills from kindergarten, first-graders continue to expand their understanding of the world around them.

By observing the world, first-graders can come up with possible answers to questions such as "What happens when there is no light?", "What are some ways plants and animals meet their needs so that they can survive and grow?" and "How are parents and their offspring similar and different?" First-graders will be active learners who are doing science to learn science.

This information is a snapshot of learning in first-grade science. For a complete set of science academic standards, click [here](#) or visit [sde.ok.gov/oklahoma-academic-standards](http://sde.ok.gov/oklahoma-academic-standards).

### By the end of the school year, your child will:

- Investigate the relationship between sound and vibration and the connection between light and our ability to see objects.
- Increase understanding of how plants and animals use the outermost parts of their body to help them survive, grow and meet their needs.
- Examine the ways parents help their offspring survive and study how young plants and animals are similar to, but not exactly the same as, their parents.
- Observe, describe and predict patterns in the movement of objects in the sky (the moon, stars, sun, etc.).

### What to do at home:

- Explore the sounds made by everyday objects and instruments such as tuning forks and stretched strings and ask your child to identify them.
- Go on nature walks and ask your child to describe plant and animal parts and how they might help them survive. For example: Roses have sharp thorns that hurt, which might discourage people from picking them.
- Observe the sun, moon and stars and ask your child to describe the differences in their appearance or location from observation to observation.
- Go to the zoo or watch videos of baby animals and their parents and describe how they interact. Ask your child to describe the ways baby animals and parents look alike and different.



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## Fostering Curiosity

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Cultivate your child's curiosity with guiding questions like these:

- What are you interested in knowing more about?
- What else does that make you think of?
- Where do you think we can learn more about these things?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Increase vocabulary, thinking skills and curiosity by using new words and having conversations that include questions that make your child think. Communicating with others gives children a chance to see and understand that there can be more than one idea on a given subject. Accepting these different ideas helps children learn how to get along with others. This acceptance fosters positive relationships with peers and strong self-image.

Cultivate your child's communication skills with questions like these:

- Who did you play with today? What did you play?
- What was your hardest rule to follow today? Why was it hard?
- What was your favorite part of the day and why?
- Can you tell me an example of kindness you saw and/or showed today?

## Fostering Comprehension

Children who are on their way to becoming independent readers need time to read alone and with others. Families should take time to talk about books, magazines and other types of print with young readers. Use the following questions to help your first-grader better understand what he or she is reading.

### BEFORE READING

- What do you think this book is about?
- What do you think will happen?
- Why did you pick this book?

### DURING READING

- What has happened so far?
- What do you think will happen next?
- Where and when does the story take place?

### AFTER READING

- What happened in the beginning, middle and end?
- What did you learn from the book?
- Does it remind you of any other books you have read?

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## SECOND GRADE

### What to expect:

In second grade, children begin to ask bigger and deeper questions as they broaden their knowledge of the world. Science education plays an important role in supporting the development of language and literacy skills by exposing your child to words connected to classroom observations. Science education helps second-graders formulate answers to questions like: "How does land change, and what causes it to change?" and "What do plants need to grow?"

This information is a snapshot of learning in second-grade science. For a complete set of science academic standards, click [here](https://sde.ok.gov/oklahoma-academic-standards) or visit [sde.ok.gov/oklahoma-academic-standards](https://sde.ok.gov/oklahoma-academic-standards).

### By the end of the school year, your child will:

- Develop an understanding of what plants need to grow and how they depend on animals for seed dispersal and pollination.
- Develop an understanding of observable properties of materials through study and classification of them. Students might observe color, texture, hardness and flexibility, study the similar properties different materials share or investigate ice and snow melting or frozen objects thawing.
- Understand that wind and water can change the shape of the land and compare possible solutions that could slow or prevent such change.
- Use information and models to identify and represent shapes and kinds of landforms (plains, hills, mountains) and bodies of water. Using maps, be able to locate where water is found on Earth.

### What to do at home:

- Grow plants in a box garden or in planters and ask your second-grader to discuss things that will help the plants grow.
- Go on a nature walk in the neighborhood or a park and write down the different plants, insects and animals you see. Then go to a different neighborhood or park and find out if the same plants, insects and animals are present. Write down what you find.
- Go on a scavenger hunt in the kitchen and ask your child to put all the bowls, utensils, pots and pans in groups based on similarities and differences.
- Be on the lookout for how things change outside after a windy day or a strong rain. Ask your child to describe those differences and how the wind or water might have caused the change.



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### Fostering Curiosity

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Cultivate your child's curiosity with guiding questions like these:

- What do you notice or wonder about in your community?
- What new words or new things have you discovered?
- How can you solve the problems you see?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

### Fostering Communication

Increase vocabulary, thinking skills and curiosity by using new words and having conversations that include questions that make your child think. Communicating with others gives children a chance to see and understand that there can be more than one idea on a given subject. Accepting these different ideas helps children learn how to get along with others. This acceptance fosters positive relationships with peers and strong self-image.

Cultivate your child's communication skills with questions like these:

- If you switched places with your teacher tomorrow, what would you teach the class?
- What was the best thing that happened today? What was the worst?
- Did you learn something that challenged you today or was there something you didn't understand?

### Fostering Comprehension

As children continue to strengthen their reading skills, they benefit from reading independently and with adults. Exposing children to a variety of print materials such as books, magazines, etc., allows them to explore new words and ideas. Use the following questions to help your second-grader better understand what he or she is reading.

#### BEFORE READING

- What do you think this book is about?
- What do you think will happen?
- What kind of book is this?

#### DURING READING

- What do you think will happen next?
- Where and when does the story take place?
- What do you notice about the characters?

#### AFTER READING

- Why do you think the author wrote this book?
- What happened in the beginning, middle and end?
- What was your favorite part of the book?

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## THIRD GRADE

### What to expect:

In third grade, children learn about the natural and physical world around them while beginning to observe, experiment and share what they have learned. Third-graders will discover answers to questions such as, "What is typical weather in different parts of the world and during different times of year?", "How are organisms like plants and animals different?", "How are plants, animals and environments of the past similar or different from the ones of today?", "What happens to organisms when their environment changes?" and "How do forces on an object affect that object?"

### By the end of the school year, your child will:

- Organize and use data to predict what kind of weather will happen next.
- Develop an understanding of the similarities and differences in the life cycles of plants and animals.
- Understand inherited traits and how living things can adapt to their environment.
- Explain how differences in characteristics among members of the same species may provide advantages in finding mates, reproducing and survival.
- Plan and conduct investigations on the effects of forces on moving objects.
- Develop an understanding of how changes in the environment make an impact on organisms.
- Determine the cause and effect relationships of magnetic interactions.

### What to do at home:

- Discuss what causes a swing or see-saw to move or come to a complete stop.
- Discuss the weather forecast each day, including temperature, wind and precipitation.
- Talk about the properties of a good shelter to use during severe weather.
- Take a nature walk and identify living things and how they are able to survive in their environment.
- Visit a zoo or farm and identify how the animals and their offspring are alike and different.
- Look for things a magnet will attract or stick to.



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## Fostering Curiosity

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Cultivate your child's curiosity with guiding questions like these:

- Go outside and throw or kick a ball. Ask your child if it's possible to keep the ball moving without it stopping. Why or why not?
- Observe the weather outside during different seasons. What differences does your child notice between the seasons in temperature, clouds, rainfall, temperature, etc.?
- Ask your child if every kind of animal, or only some animals, could survive in your backyard or near where you live.

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Families can play a role in helping their children learn to be good communicators by encouraging them to add new words to their vocabulary, express themselves and be good listeners. As children's communication skills grow, they are able to learn new ideas, get along with others and develop positive relationships and a strong self-image.

Cultivate your child's communication skills with questions like these:

- What food would be served at your favorite meal?
- How did you show kindness to someone today?
- What is your favorite outdoor activity to do with family or friends?

## Fostering Comprehension

Reading is a building block for success in all school subjects and a critical skill that develops with time and practice. Encourage your child to read for pleasure, and be a good role model by reading things you enjoy. Use the following questions to help third-graders understand what they are reading.

### BEFORE READING

- What made you pick this book?
- How is this book like another one you have read or a movie you have seen?
- What do you think the book will be about?

### DURING READING

- What has happened so far in the story?
- What pictures do you see in your mind as you read?
- What words can I help you understand?

### AFTER READING

- What was the most important event in the story? Why?
- What lesson do you think the author wants the reader to learn? What makes you think that?
- If you could give this book a different title, what would it be? Why?

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## FOURTH GRADE

### What to expect:

In fourth grade, students discover answers to increasingly difficult questions about the world around them. These include: “What are waves, and what do they do?”, “How can water, ice, wind and plants change the land?”, “What features of Earth can you see with maps?”, “How do internal and external parts support plants and animals?”, “What is energy, and how is it related to motion?”, “How is energy transferred?” and “How can energy be used to solve a problem?”

### By the end of the school year, your child will:

- Understand how water, ice, wind and plants affect the rate of breakdown in rocks and the movement of rocks from place to place.
- Analyze and interpret data from maps to describe patterns in Earth’s features.
- Use a model to describe patterns of waves and how waves can cause objects to move.
- Develop an understanding of the ways internal and external parts of plants and animals support their survival, growth, behavior and reproduction.
- Develop a model to describe how an object can be seen when light reflected from its surface enters the eye.
- Create an explanation of the relationship between the speed of an object and the energy of that object.
- Understand how energy can be transferred from place to place by sound, light, heat and electric currents or from object to object through collisions.

### What to do at home:

- Talk about why it might be harder to see at night or in a dark room compared to in daylight or a brightly lit room.
- Look at different plants growing outside. Discuss parts of the plants that help them grow or survive.
- When you’re driving, ask your child why the windows on one side of the car facing the sun are warmer than the other car windows.
- Toss a ball outside and discuss how to make it go shorter and farther distances.

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Cultivate your child's curiosity with guiding questions like these:

- What kind of material would we use to build a house that could withstand an earthquake?
- What would happen if we dropped a rubber duck or other floating object into a bowl of water?
- What would happen to the land if it rained nonstop for a year?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Families can play a role in helping their children learn to be good communicators by encouraging them to add new words to their vocabulary, express themselves and be good listeners. As children's communication skills grow, they are able to learn new ideas, get along with others and develop positive relationships and a strong self-image.

Cultivate your child's communication skills with questions like these:

- What is the most exciting adventure you could take?
- Who would you take with you on the adventure?
- What was your favorite part of the day and why?
- How did you help someone today?

## Fostering Comprehension

Reading is a building block for success in all school subjects and a critical skill that develops with time and practice. Encourage your child to read for pleasure, and be a good role model by reading things you enjoy. Use the following questions to help fourth-graders understand what they are reading.

### BEFORE READING

- Skim through the book and chapter titles. What do you think the book will be about?
- How is this book like another one you have read or a movie you have seen?
- What type of book did you choose (fiction, biography, graphic novel, etc.)? Why?

### DURING READING

- What do you think will happen in the next chapter?
- Who is the main character? Who are the supporting characters?
- What words can I help you understand?

### AFTER READING

- Could this story take place in today's world? Why?
- What lesson do you think the author wants the reader to learn? What makes you think that?
- If you were one of the characters in the book, how would you have ended the story? Why?

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## FIFTH GRADE

### What to expect:

In fifth grade, students are able to answer more advanced scientific questions. These include: "When matter changes, does its weight change?", "How much water can be found in different places on Earth?", "Can new substances be created by combining other substances?", "How does matter work its way through ecosystems?", "Where does the energy in food come from, and what is it used for?", "How do shadows or the amount of daylight and darkness change from day to day?" and "How does the appearance of some stars change in different seasons?"

### By the end of the school year, your child will:

- Develop an understanding that regardless of how matter changes form, its weight does not change.
- Determine if the mixing of two or more substances results in new substances.
- Create a model to describe how the geosphere (Earth's surface), biosphere (living organisms), hydrosphere (water) and atmosphere interact with one another.
- Describe and graph data to show how water is distributed on Earth.
- Develop a model to describe how matter is made of particles too small to be seen.
- Understand why and how plants get most of the materials they need to grow from air and water.
- Use models to describe how energy in animals' food was once energy from the sun.
- Develop an understanding of daily patterns of change in the length and direction of shadows, the amount of daylight and darkness and the seasonal appearance of some stars in the night sky.

### What to do at home:

- Ask your child to cook with you and discuss how, when you mix two or more substances together, they sometimes form a new substance.
- Discuss how the construction of a new house or building might change the ecosystem from before the construction began.
- Go outside on clear nights and look at the stars. Ask your child to describe patterns they notice and explain how the sky looks different in the summer versus the winter.
- Research your town's local recycling program or facility.



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## Fostering Curiosity

Children are naturally curious and want to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Play is a wonderful way to spark curiosity, so be sure to allow plenty of playtime. Encourage your child to ask questions, be creative, discover answers and explore the world.

Cultivate your child's curiosity with guiding questions like these:

- Do you think animals communicate? If so, how?
- What are the best things about nature?
- Does the night sky look the same every night of the year? Why or why not?

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Families can play a role in helping their children learn to be good communicators by encouraging them to add new words to their vocabulary, express themselves and be good listeners. As children's communication skills grow, they are able to learn new ideas, get along with others and develop positive relationships and a strong self-image.

Cultivate your child's communication skills with questions like these:

- What do you think we should have for breakfast tomorrow?
- What goals can you set to make tomorrow better than today?
- What was your favorite part of the week and why?
- How did you help someone in need today?

## Fostering Comprehension

Reading is a building block for success in all school subjects and a critical skill that develops with time and practice. Encourage your child to read for pleasure, and be a good role model by reading things you enjoy. Use the following questions to help fifth-graders understand what they are reading.

### BEFORE READING

- Is this the type of book you usually choose? Why or why not?
- By looking at the cover, what do you think the author's reason for writing the book might be?
- What do you think the book will be about?

### DURING READING

- Will you read a short section to me with feeling in your voice?
- What do you do when you don't understand what you just read?
- What resources can you use to understand words you aren't familiar with?

### AFTER READING

- Give a summary of the book in 10 words.
- What problem did the main character face? What was the solution to that problem?
- What message is the author sharing with the reader? Why do you think that?

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## SIXTH GRADE

### What to expect:

In sixth grade, students will build on ideas and knowledge from earlier grades to learn about the physical sciences, life sciences, earth science and space science. With coaching from teachers, they will use core science ideas and scientific and engineering practices to understand and explain observations in the physical, life, earth and space sciences.

### By the end of the school year, your child will:

- Describe changes in the motion of particles of a substance when thermal energy is added or removed.
- Determine the factors that affect the strength of electric and magnetic forces.
- Provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
- Use graphs to describe the relationships of kinetic (in-motion) energy to the mass (amount of matter) of an object and its speed.
- Understand what impacts the kinetic energy of particles.
- Develop a model to describe the function and parts of a cell.
- Understand that the body is a system of interactive subsystems made up of cells.
- Explain the role of photosynthesis in plants and other organisms and their growth.
- Understand how available resources affect organisms.
- Predict patterns of interactions among organisms across multiple ecosystems.
- Develop a model to describe how matter and energy cycle through an ecosystem.
- Describe how water cycles through Earth's systems with energy from the sun and the force of gravity.

### What to do at home:

- Ask your child to draw how water particles may be interacting with each other in ice versus in water.
- Discuss why some cups keep drinks hotter or colder than other cups.
- Discuss why the grass might turn brown during drier months and why grass needs to be mowed after it has rained for several days.
- Find a puddle outside, then go back after the sun has come out and ask your child to explain what happened to the puddle.
- Visit a theme park and ride or watch a roller coaster. Discuss why sometimes the roller coaster moves faster and other times more slowly.



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FOR FAMILIES

## Fostering Curiosity

Children are naturally curious and want to learn about things that interest them. Since curiosity contributes to success in the classroom, it is important to encourage it at home. Provide opportunities for your child to ask questions, be creative, discover answers and explore the world.

Cultivate your child's curiosity with guiding questions like these:

- If you could invent something that would make life easier for people, what would you invent and why?
- What kind of container would keep your coffee the hottest for the longest period of time?
- What would the world's fastest runners look like in slow motion?
- Tell me something about science you don't think I already know.

Your child will have plenty of questions. It's okay if you don't have the answer every time. The best response is always, "Let's find out together."

## Fostering Communication

Families can play a role in helping their children learn to be good communicators by encouraging them to add new words to their vocabulary, express themselves and be good listeners. As children's communication skills grow, they are able to learn new ideas, get along with others and develop positive relationships and a strong self-image.

Cultivate your child's communication skills with questions like these:

- What goals can you set to help you become a better person?
- What is your favorite part of the year and why?
- How can you make a positive difference for someone today?

## Fostering Comprehension

Reading is a building block for success in all school subjects and a critical skill that develops with time and practice. Encourage your child to read for pleasure, and be a good role model by reading things you enjoy. Use the following questions to help sixth-graders understand what they are reading.

### BEFORE READING

- Are you keeping a list of books you have already read? Why would it be good to keep a list like that?
- How is this book like another book you have read or a movie you have seen?
- Why did you pick this book?

### DURING READING

- As you are reading, what questions do you have for the author?
- How does this book remind you of a book you have already read or something you already know?
- What resources can you use to understand words you aren't familiar with?

### AFTER READING

- How did the setting of the story affect the characters and plot?
- What was the theme of the book? What lesson do you think the author wanted the reader to learn?
- How would you rewrite the ending to the story? Why would you change it?

Join the conversation!  
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